National Weather Service
1301 Airport Parkway
Cheyenne, WY 82001
307-772-2468
www.nws.gov/cys
cys.info@noaa.gov

High Plains Herald

The National Weather Service provides weather forecasts and warnings for the protection of life and property and the enhancement of the national economy.

Inside this Issue:

Be a Force of Nature

By John Griffith

Severe weather affects everyone, you should know your risk, know what action to take and be an example for others to follow! That is why WFO Cheyenne is encouraging everyone to do their part and prepare now, so that you know what to do when severe weather strikes.

Each year, many people are killed or seriously injured by tornadoes and other types of severe weather, despite advanced warnings. In 2012, there were more than 450 weather-related fatalities and nearly 2, 600 injuries.

There were 936 tornadoes reported in 2012, with 206 in April alone. Property and crop damage from tornadoes last year is estimated at $1.6 billion.

Every state in the United States has experienced tornadoes and severe weather – 46 states reported tornadoes in 2012 – so everyone is exposed to some degree of risk.

Because severe weather knows no boundaries and affects every individual the National Weather Service is calling on people across the country to ***be a force of nature*** in their communities to prepare for severe weather.

This year WFO Cheyenne is asking families, communities and businesses to ***be a force of nature*** by taking the pledge to prepare at www.ready.gov/severe-weather.

When you pledge to prepare, you will take the first steps to making sure that you and your family are prepared for severe weather. These steps include developing a family communications plan, putting an emergency kit together, keeping important papers and valuables in a safe place, and getting involved in your community to encourage preparedness.

Stay informed by having multiple sources of weather alerts – NOAA Weather Radio, an adaptive weather radio for individuals with access and functional needs, or a means to receive Wireless Emergency Alerts.

Building a "Weather Ready Nation", a goal of the National Weather Service, requires the action of all of us. Each and every person across the country has the potential to ***be a force of nature*** when it comes to weather-readiness.

Studies show that individuals need to receive messages a number of ways before taking appropriate action. Many are more likely to act when the messages are received from a trusted source – family, friends, or a community leader. By sharing your preparedness actions with your community you are ***being a force of nature.***

History teaches that a lack of awareness and preparation are common threads among all major weather threats. Knowing your vulnerability and what actions you should take can save your life and others.

So what can you do? Ensure that you and your family members know about your surroundings and risk for specific weather. Stay informed by having multiple sources for weather alerts.

Have an emergency plan in place, and know what to do before severe weather strikes. Exercise the plan with your family and post it in your home where visitors can see it.

Discuss your needs with and responsibilities and how people in your network of neighbors, relatives, friends and co-workers, can assist each other with communication, care of children, pets, specific needs like the operation of medical equipment or how you can inform someone with a hearing loss about impending severe weather.

Identify an appropriate shelter in your home, neighborhood and community ahead of time. Share this with your neighbors.
Find out from local government emergency management how you will be notified for each kind of disaster and sign up for additional alerts through social media and local news. Understand these local warning systems and signals and share your knowledge with your coworkers and friends.

Be a force of nature!

"Our website will be updated as new talks are scheduled."

Inside this Issue:

Weather Spotter Training

Below is the list of severe weather spotter training events scheduled for southeast Wyoming and the Nebraska panhandle in 2013. Our website will be updated as new talks are scheduled. All talks are open to the public, last about 90 minutes and are free of charge. No prior experience is necessary. We will teach you everything you need to know! If you have any questions about these events, contact our Warning Coordination Meteorologist, John Griffith, at 307-772-2468 extension: 726.

March, 2013 - Upcoming

Day	City, State	Time	Location
26	**Bridgeport, NE** (Morrill County)	**7:00pm MDT**	Fire Hall
27	**Scottsbluff, NE** (Scotts Bluff County)	**7:00pm MDT**	WNCC Harms Advanced Tech Center 2620 College Park - South Bay

April, 2013 - Upcoming

Day	City, State	Time	Location
4	**Glenrock, WY** (Converse County)	**6:00pm MDT**	Town Council Chambers
9	**Hemingford, NE** (Box Butte County)	**7:00pm MDT**	Fire Hall
11	**Kimball , NE** (Kimball County)	**6:00pm MDT**	Fire Hall
15	**Wheatland, WY** (Platte County)	**6:30pm MDT**	Fire Training Site
16	**Torrington, WY** (Goshen County)	**1:00pm MDT**	Goshen County Courthouse Basement - Training Room
16	**Torrington, WY** (Goshen County)	**6:30pm MDT**	Goshen County Courthouse Basement - Training Room
17	**Cheyenne, WY** (Laramie County)	**6:30pm MDT**	Laramie County Community College CCI Building Room 130
18	**Fort Robinson, NE** (Dawes/Sioux County)	**6:00pm MDT**	Buffalo Barracks
23	**Laramie, WY** (Albany County)	**6:30pm MDT**	Laramie Fire Dept Station 3 2374 Jefferson St
24	**Alliance, NE** (Box Butte County)	**7:00pm MDT**	Fire Department Training Building W 3rd St
	Contact Information: *john.griffith@noaa.gov*		

"It was technical and sometimes demanding outdoor work."

Inside this Issue:

Women In The Weather Bureau During World War II

By Debbie Winston

We have all heard the stories of Rosie the Riveter, but did you know that many women contributed to the mission of the Weather Bureau during World War II? These women worked with surface weather observations, RAOBs - Radiosonde Weather Balloon Observations, PIBALs – Pilot Balloon Observations, map plotting, telegraph reporting, filing observations, drawing maps, and advising pilots and airport tower staff of weather conditions. They also worked rotating shifts and it was not uncommon for them to work unpaid overtime and seven day weeks.

Tracking a Pilot Balloon

Initially the women were told that, "Women can't do this kind of work". Since there were very few men to fill the positions, there was no choice but to let the women try. It was technical and sometimes demanding outdoor work. The women reported being well received once they got to their assigned stations. They definitely "made a major contribution to the war effort" and they proved that women were capable of doing the same work as men. Although they did report that the pilots and tower staff did not like "young girls" telling them what to do (advise instrument landings or divert aircraft to other airports).

Some of the women went through six weeks of training at regional offices before choosing their duty stations. Others went through local on the job training. They were paid between $1440 and $2450 annually, filling openings that were vital to the war.

Inflating a Pilot Balloon.

Over 900 women were employed by the Weather Bureau by 1945. Many that were hired as temporary employees during the war were later converted to permanent employees. Many of these women went on to get degrees in Meteorology.

These women had some interesting experiences and even made some new discoveries. Below are a few of their personal stories.

"Another girl and I were ready to release our radiosonde from the roof of the terminal building at Great Falls but had to wait for a B-17 that was on final approach. The B-17 touched down on the end of the runway and we released the balloon. To our horror, the balloon didn't rise. The wind carried it out toward the runway...barely skimming across the ground. It seemed like forever...but just before it reached the runway and the B-17, the balloon began to rise. The B-17 rolled on down the runway...unaware of two speechless young ladies on the roof." ~ Shirley Kodalen Buhmann, Great Falls, MT

"The most exciting event which occurred while we were at Bethel was the finding of one of the mysterious Japanese incendiary devices with the attached balloon and gear. A native found it out on the tundra a few miles from our station and brought it to the state marshal! who, in turn, brought it to the weather station. At that time no one was aware of what it was or what its purpose was. We were certain it had Japanese origins. We later learned many of these had been found along the west coast." ~ Grace D. Harding, Seattle, WA

Jet Stream Discovered

"I have already mentioned Inspectors from the Regional Office. They were always available for discussions with employees. One day, I had a three-hour "conference" with an inspector. With our Pilot Balloon Observations, we had found what later would be found as jets and then called the Jet Streams. We knew they were there and real, BUT were not allowed to report them, or even retain (that information for) the observational information that was mailed to Ashville, North Carolina. If we mailed in those observations, or reported them, we were charged errors. We KNEW that the wind speeds were really up there, so I was trying to obtain permission to mail in the observations for future investigation. I LOST. The official contention was that strong winds at those heights COULD NOT EXIST. We were told that something was happening to the balloon! We knew better!" ~ Kathryn C. Gray, Houston, TX

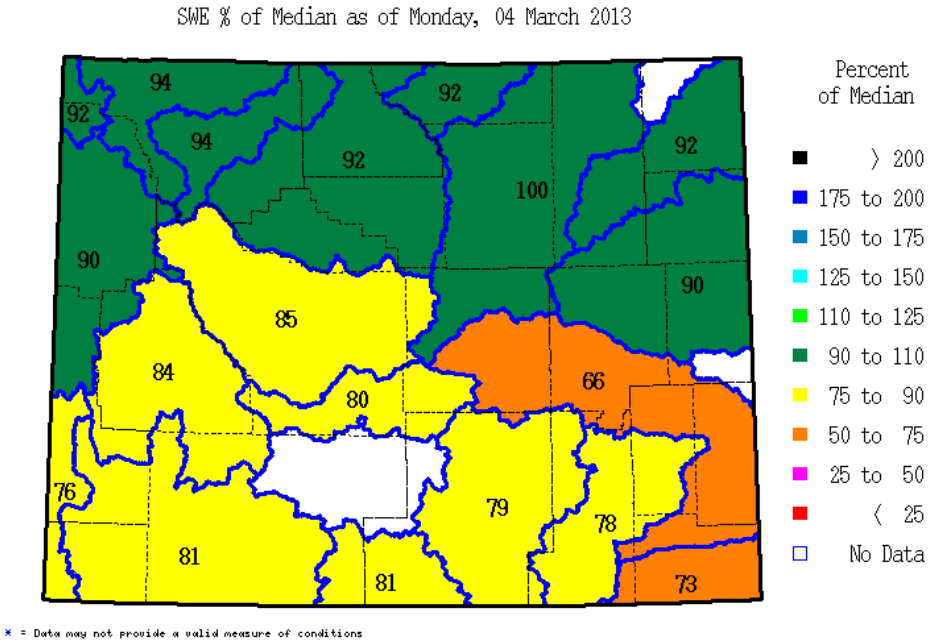
"Our ceiling balloon would often start out toward the mountains. Then suddenly it would come back fast, with us twirling the knobs as fast as we could to keep it in sight as it sailed east. Later, when plotting the run on a chart, we would discover amazing wind speeds of 80-100 mph at 30,000 feet or so. In those days planes flew much lower so they hadn't discovered the jet stream. Now it is used routinely and planes often get in ahead of schedule. Also the jet stream's position determines the weather pattern." ~ Dorothy Hurd Chambers, Denver, CO

Spring and Early Summer Snowmelt/Flood

By Mike Weiland

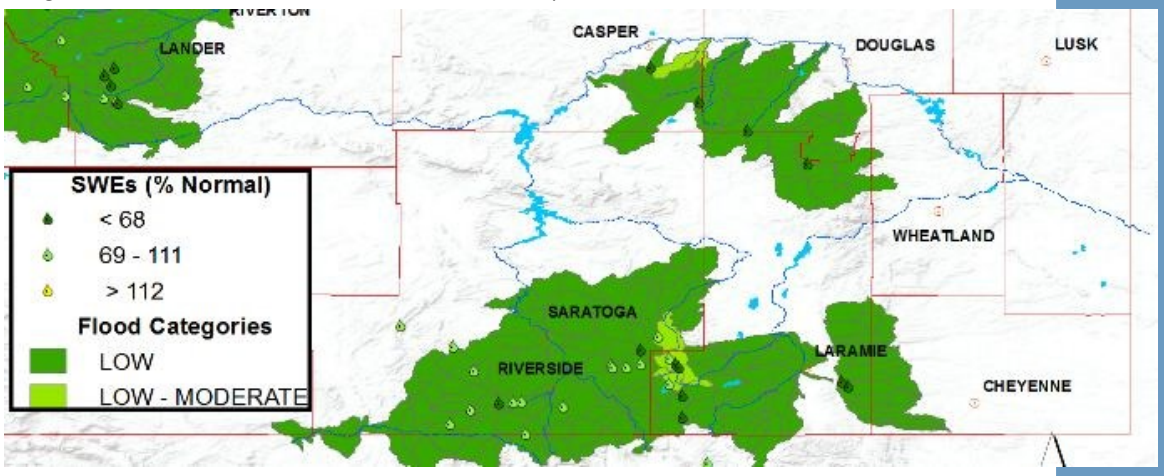
Spring and Early Summer Snowmelt Flood Potential

Mountain snowpack at of the start of March 2013 was between 70% and 90% of the 30 year normal values. The largest value in our area was in the Little Snake River Basin where there was 81% of normal snowpack. The lowest values in our area was 66% of normal snowpack in the Lower North Platte Basin.



Map from the USGS showing percent normal snowpack as of March 4.

Those values are slightly lower than those of last year at that time. In the absence of significant rain on the snowpack late this spring and early this summer, the snowmelt runoff is expected to be between 50% and 75% of normal values for the rivers and streams originating from the southeast Wyoming and far northern Colorado mountains. The following map shows the spring and early summer snowmelt flood potential. Keep in mind, that snowfall in the mountains yet this spring could change these values some as well as the snowmelt flood potential.



February 2013 Flood Potential in Southeast Wyoming and far western panhandle basins.

CoCoRaHS

CoCoRaHS (Community Collaborative Rain and Hail Study) needs more volunteers. If you have an interest in weather and would like to report the daily rain and snowfall at your house, then CoCORaHS is for you! Check out the web site at cocorahs.org and look at the daily rain and snow maps. The study began in Fort Collins in the summer of 1997. Since then, it has spread to the entire country and even Canada, with well over 10,000 people reporting their daily precipitation. For more information, please visit the website or call Mike at 772-2227.

Inside this Issue:

Weather 101: Weather Text Alerts

By Debbie Winston

Weather Text Alerts for cell phones have arrived. These new weather alerts are part of a partnership between the National Weather Service, FEMA, the FCC and the wireless industry. So what are they and how do they work? The National Weather Service broadcasts that currently go out to NOAA Weather Radio's will now also come to your cell phone in the form of a text message. They will be a bit different, in that they will automatically show on your screen, you won't have to open the message. Also, your cell phone receives the messages based on the cell towers near by. That means that you will receive messages for the area you are in, not just your home area code. If you live in Indiana and you are visiting Colorado, you will get the alerts for Colorado while you are there.

There are different types of alerts. In most cases the messages are letting you know that you should look for more information on the situation (turn on a television or radio, etc.). In the case of an immediate danger such as an Earthquake or a Tornado, you will be advised to seek immediate shelter. You should follow any action advised by the message.

The alert system may also send out Amber Alerts, local hazards (toxic chemical spill, etc.), information on national emergencies, and Presidential Emergency Messages.

Because the alerts are based on cell service they are dependent on service in the local area, so receiving the alerts is not guaranteed. Also, not all cell phones are capable of receiving the messages. Check with your wireless provider for more specific information on what is available through your network. There is no need to register or subscribe for these emergency text alerts. The messages are free and will not count towards any texting limits on your wireless plan.

What's New with Social Media

By Rebecca Mazur

Have you liked NWS Cheyenne on Facebook yet? Do you follow @NWSCheyenne on Twitter? Did you know we have a You Tube page now?

NWS Cheyenne continues to broaden the use of Social Media in many facets of operations, including forecast and verification information, video briefings on potential high impact events, and information on other outreach activities. Soon, we will roll out a weather photography contest and Weather 101 educational section. Also, our spotter training classes will begin soon, and each event is listed under the events section on Facebook. Let us know if you plan on attending any of these classes!

This upcoming severe weather season, Facebook and Twitter will become a major part of our forecast operations. We will be actively seeking reports and pictures of hail, tornadoes and other rotating clouds, and flooding that you happen to observe in your neck of the woods, but please do not put yourself in harms way to get the shot. In addition, we'd like to know of any damage that may have resulted from severe weather.

If there's anything you'd like to share with us, or have a specific question in mind, let us know!
Like us on Facebook - http://www.facebook.com/US.NationalWeatherService.Cheyenne.gov
Follow us on Twitter – www.twitter.com/NWSCheyenne
YouTube – www.youtube.com/NWSCheyenne

Inside this Issue:

"...Facbook, and Twitter will become a major part of our forecast operations..."

"...watch the skies this summer..."

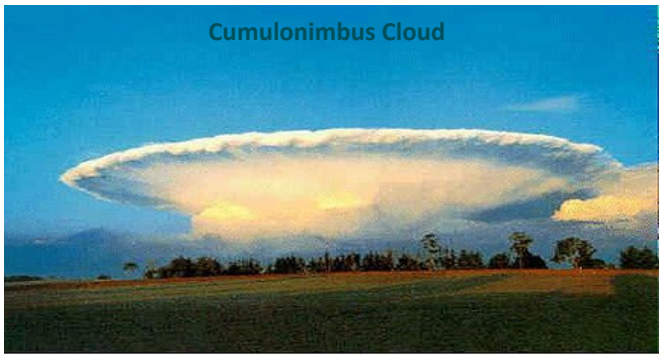
Inside this Issue:

Weather 101: Storm Clouds

By Debbie Winston

Cumulonimbus clouds are commonly known as storm clouds. They form when warm moist air is suddenly lifted and are usually 5 to 8 miles in height and high winds at these elevations flatten the top of the cloud to form the anvil shape. Cumulonimbus clouds can produce scary looking clouds, heavy rain, hail, high winds, lightning and tornadoes.

Cumulonimbus Cloud

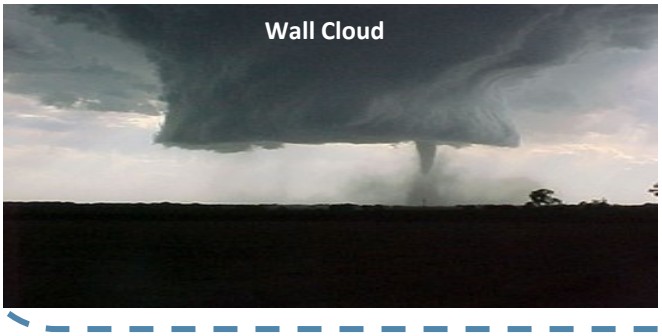


Cumulonimbus clouds sometimes form shelf clouds and/or wall clouds as they develop. Shelf clouds (roll clouds) are horizontal clouds that form around the cloud base.

Shelf Cloud

Wall clouds are vertical clouds that hang below the cloud base like a wall in the rain free area. While wall clouds are not necessary for the appearance of tornadoes they are often present and should be watched closely for the possibility of the formation of a tornado.

Wall Cloud



Hail formation requires a strong updrafts of warm air and down drafts of cold air, as well as lower freezing levels in the storm. A water droplet is picked up by the updraft and is carried up through the cloud past the freezing level. The droplet freezes and then begins to fall. The droplet may melt and fall to the ground as rain, it may stay frozen and fall to the ground as hail, or it may continue to circulate through the cloud many times, each time freezing more water onto the hail stone, which makes it bigger. Hail stones can also, start to melt on the down draft and then freeze together on the updraft to form large hail stones.

If the anvil has an over shooting top (clouds seeming to boiling out of the top) it indicates that the storm is unstable and likely a strong super cell storm capable of producing heavy rain, large hail, high winds, lightning and tornadoes.

So watch the skies this summer and let us know if you see any of these storm clouds. Better yet attend our Weather Spotter Training and learn more about what to look for and when to call, post on Facebook, or Tweet to let us know what is going on.

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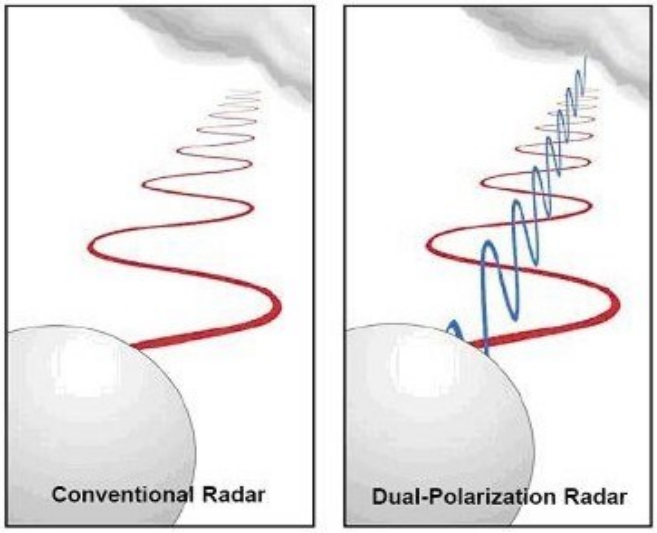
Dual-Polarization WSR-88D

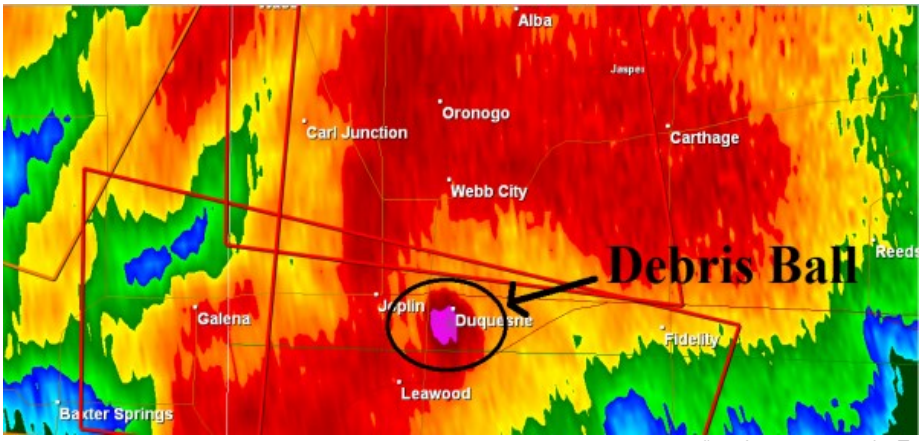
By Mike Jamski

The National Weather Services across the United States are upgrading to better radar technology that can provide meteorologists better radar data that can improve warnings and lead time. The upgrade, called Dual Polarization (aka dual-pol), will be installed in all 160 National Weather Service offices. The standard Doppler radar transmits and receives information horizontally. With the dual-pol upgrade, meteorologists will be able to transmit and receive information in both horizontally and vertically in the atmosphere. These upgrades will improve the accuracy and identification of precipitation types, precipitation estimates, and even be able to view tornadoes better. These upgrades will continue across the United States and all offices should have the dual polarization technology installed by May 2013.



The Doppler radar used at the National Weather Services in the United States is called the WSR-88D. When radar is used, it detects atmospheric objects in the air. It can detect precipitation in the air such as rain and hail, and it can also depict non-weather objects such as aircraft, birds, and bugs. When a beam exits the old radar, it only measures things in the air horizontally. The old radar allows us to see a rough estimate of the intensity of precipitation, the speed and direction of the precipitation, but provides very little information regarding precipitation type. With the dual-pol upgrade, the radar will have a better handle of the shape and size of that object suspended in the air as the beams travel both horizontally and vertically. In a way, it gives meteorologists a clearer image of exactly what they are looking at.

Dual polarization will improve flash flood warnings, severe thunderstorm warnings, and tornado warnings. The output of the dual pol radar will allow meteorologists to see more debris within the storm that indicates a possible tornado. Before hand, we could only detect debris within a severe thunderstorm when the tornado was hitting a populated area and was at a fairly significant strength. These images were called debris balls that showed a higher dBZ (decibels of Z) or higher reflectivity (brighter colors). The image below is the EF-5 tornado that struck Joplin, Missouri in May 2011. Radar indicated a debris ball which showed brighter colors (high dBZ) indicating debris in the air:



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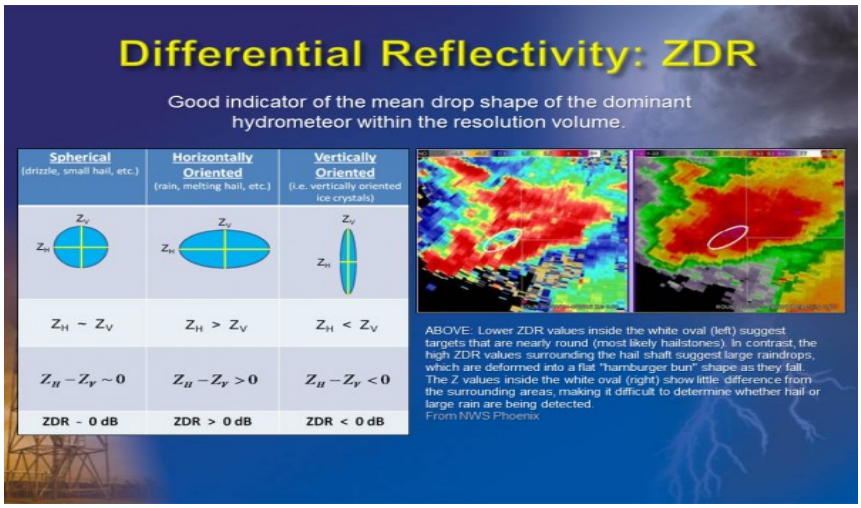
Dual-Polarization WSR-88D Continued

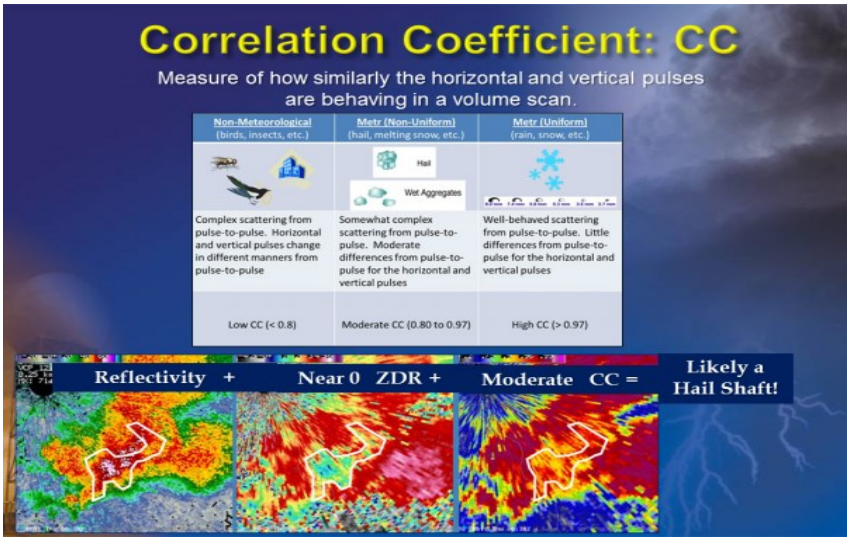
By Mike Jamski

Dual polarization will add three new base products that meteorologists can use to further estimate precipitation. They are the Differential Reflectivity (ZDR), Correlation Coefficient (CC), and Specific Differential Phase (KDP).

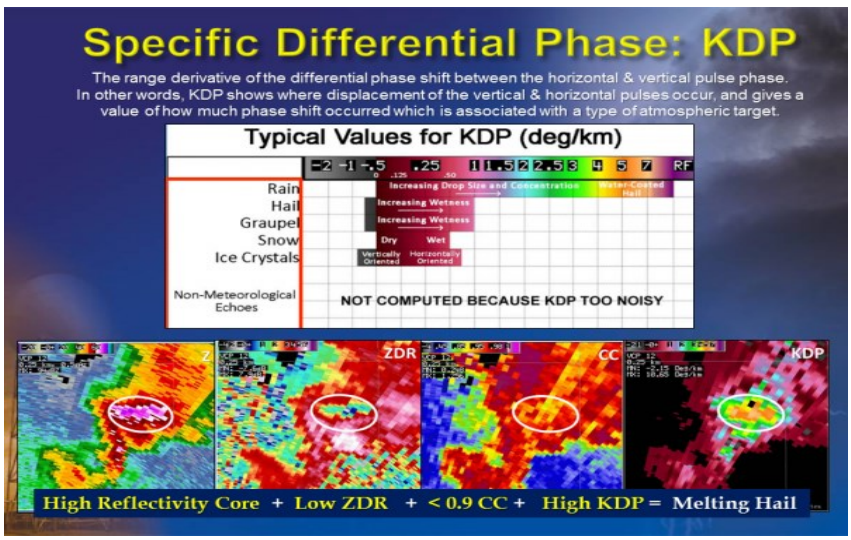
ZDR shows the difference between the horizontal & vertical reflectivity factors (units dBz):



CC measures how similar the horizontal and vertical pulses are behaving in a pulse volume:



KDP is the range derivative of the differential phase shift between the horizontal and vertical pulses:



All images supplied by NOAA

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